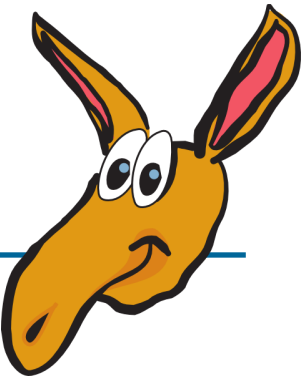
Issue 4

October 2016

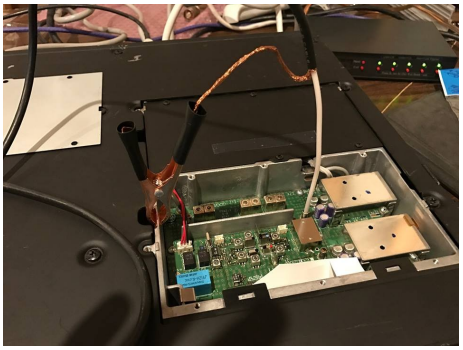
Utah Valley Amateur Radio Club

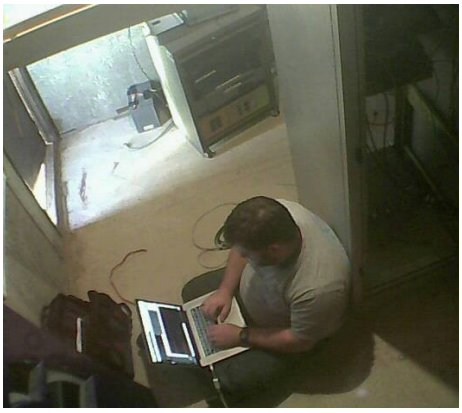
The UVARC Shack



UVARC-tober

The 70-cm repeater, 448.200-MHz (100.0 Hz tone), is back up and running, with a vengeance. But once in a while we still experience a few repeater issues, so please forgive our lack of experience in dealing with this aspect of our club in the months ahead. We hope to have all major issues resolved before the snow caps the mountain. As you can see, our best experts are hard at work, solving problems as fast as we create new ones.





And personally, with summer behind us, we're busy trying to get last-minute outdoor projects completed before the snow flies down here too. We'd like to see a lot more people get Carl's aluminum J-poles up in the air, so that they can get their signals out to us and a lot more.

Finally, it's exciting to see the kinds of things we have on our plate for the months ahead!

This month in the *UVARC Shack*

Another issue on HF DIY, but a follow-up from our last club meeting, details about programming your Baofeng and disabling WIRES on your Yaesu radios.

Looking forward to a couple of months of state and larger contests, plus news about Amazon that'll make you smile. But we still depend on your input, so keep those cards, letters, and emails coming!

Please send your ideas, stories, updates, photos, questions, complaints, and breaking news to **uvarcshack@gmail.com**

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Way to Be

Spotlight on exemplary members

So, who is it this time? It's ***YOU***, for attending our potluck last month! This is a small subset of the photos, courtesy MacJedi, N1JDI.

We found it just a tiny bit bizarre that the theme pasted on the walls of this Senior Center was *Bloom Where You Are Planted*, where people congregate who are a heartbeat away from their own spot of earth. But we lived through it anyway, and had a great time.

Brass Tacks

An in-depth look at a radio-related topic

Baofeng manual programming recap

During our October club meeting we held a Baofeng manual programming clinic, which seemed to draw quite a lot of interest. We demonstrated step-by-step how to push the right buttons to set the frequency, offset, shift direction, and tone for a repeater, then how to store the settings in a channel (memory location) for the UV-5R, UV-82, GT-3, and family models (UV-5RA, UV-6R, UV-82HP, GT-5, etc.) This is a summary of that session.

Why Baofeng?

In recent years amateur radio has seen a huge increase of people getting on the air, partly because of relaxed licensing requirements, but also due to a large infusion of inexpensive handheld radios, most of them by Baofeng, a Chinese manufacturer. These little units are not only lightweight, but also come with all sorts of attractive features, such as a flashlight / strobe, FM broadcast receiver, alarm, dual-band, dual-receiver, and the ability (good or bad) to transmit on FRS / GMRS / MURS (walkie-talkie) channels (and the UV-82 series with dual-PTTs.)

On the other hand, Baofeng handhelds come with their share of drawbacks, one of them being difficulty in programming them. And by *programming* we're talking about tuning the radio to a frequency, along with possible repeater settings, and storing those settings in a memory channel. Hopefully, this will help take some of the mystery out of programming some of the more common Baofeng handheld radio models.

Prelude

To start, be sure your radio is in *Frequency Mode*, instead of *Channel Mode*. For most models this is done with a push of the VFO/MR (or V/M) button. For the UV-82 series, hold the MENU button while turning on the unit. Furthermore, the top channel (A) must be active, indicated by the little black triangle in the display to the left of the channel. If it's not, just push the A/B (or AB) button to change it.

Proceed to punch in the frequency by pressing all six digits in MHz. For the 146.780 MHz repeater, for example, press 1—4—6—7—8—0 on the numeric key pad. The current power setting will also be stored, so be sure it's set to your desired level in the menu by setting TXP to HIGH or LOW. The next page contains the remaining steps for repeater settings and channel storage.

Simplex, BTW

To modify a setting for simplex operation, change the shift direction (SFT-D) to OFF:

Set simplex operation (*SFT-D* : OFF)

MENU 25	MENU OFF	MENU	EXIT

Change to simplex operation

Brass Tacks

continued

The steps

Set the repeater offset (*OFFSET* : 00.600)

MENU 26	MENU 00600	MENU	EXIT

Set the repeater offset (shift) direction (*SFT-D* : –)

MENU 25	MENU –	MENU	EXIT

Set the repeater tone (*T-CTCS* : 100.0HZ)

MENU 13	MENU 1000	MENU	EXIT

Set for a 2-meter repeater with a 100.0 Hz tone, for example

First delete the memory channel contents (*DEL-CH* : 017)

MENU 28	MENU 017	MENU	EXIT

Store the radio receive (*MEM-CH* : 017) "receiving memory"

MENU 27	MENU 017	MENU	EXIT	*

Store the transmit (*MEM-CH* : 017) "transmitting memory"

MENU	MENU	MENU	EXIT	*

Store the settings in memory channel 17, for example

— Noji Ratzlaff, KNØJI (knØji@arrl.net)

Dear Annette

What's on your mind? Serious, humorous, technical, and thoughtful answers to your deepest, (mostly) ham-related questions.

Dear Annette:

Why is it that 10 meters does not seem nearly as open in the summer as it does in winter?

Mr. Potato Head in Provo

Dear To Head:

If you thought 6 meters is a magical band, you might find working10 meters to be nothing short of wizardry. When the near-vertical summer sunlight strikes the ionosphere, oxygen ions tend to de-ionize at a rate faster than UV light can ionize it, resulting in a net lower electron density, and therefore lower MUF (maximum usable frequency). This seasonal variation in MUF most drastically affects RF ionospheric reflection between 15 and 35 MHz, which includes 17, 15, 12, and 10 meters, causing northern-hemisphere 10 meter enthusiasts to hibernate in July and August.

Dear Annette:

My wife and I are putting together 72-hour kits, and we want to include a handheld ham radio in each. Which model of radio would be best for our kits?

Ready in Orem

Dear Ready:

The short answer is, one for which you can get an empty *sled*, or alkaline battery pack. Today's rechargeable batteries (Li-ion, NiMH) hold their charge much longer than they used to. But they still lose their charge after a period of time, meaning you need to constantly check and charge them if they're stashed away with your go-kit. If you populate an empty sled (I recommend two per kit) with alkalines, and not attach it to your radio until you need it, it'll last a long time, and will most likely be ready to use when you need it most. Just be sure to use a dummy battery in place of one of the alkalines if your sled requires six batteries.

Dear Annette:

You seem like a very nice, intelligent person, and I'd like to meet you. What do you say we go out some Saturday night?

Single in Spanish Fork

Dear Single:

Tell you what, come to the next club meeting night, and you can meet my husband too.

Dear Annette:

Here goes nothing. Last week I got on the radio for the third time ever, and apparently my sound didn't come through very loud, and a couple of people came on and essentially gave me the third degree and criticized how I sounded. I'm already nervous about speaking on the air, but I felt terrible afterwards. Maybe ham radio just isn't my cup of tea.

Dismayed in Mapleton

Dear Dismayed:

I'm so sorry you had to endure that! One of the purposes of this club and repeater is to provide a haven for new hams to learn and make mistakes without fear of retribution or belittlement. Unfortunately it sounds as though some older hams need to learn patience and how to properly and gently coach newer hams. I highly encourage you to hang in there, and not let this bad experience be your last.

Got a question for Dear Annette? Send your email to ***uvarcshack@gmail.com*** *and include your town. Her name arises from everybody's seeming desire to "hold Annette." Go figure.*

My Shack

Highlighting the shack (ham equipment and room) of a member, to give others an idea of what more experienced hams have set up

Lovell Killpack, W7CU

In 1940 at the ripe age of 16, I was licensed as W6STC, when Utah was still part of Call Sign Area 6 (now 7.) Worked in Provo at station KOVO until WW II. Actually had a QSO with a station in Schofield Barracks, Hawaii, just a few days before the Pearl Harbor attack. Joined the Army in 1943, then became a P51 Mustang fighter pilot in the Army Air Force in 1945, just before The War ended. Afterwards it was back to KOVO. In 1960 I upgraded to Extra class and W7CU.

Here's a short list of my shack equipment:

Icom IC-756PROIII HF transceiver

Ameritron AL-82 1.5 kW amplifier

Johnson Viking Matchbox antenna tuner

Kenwood TM-942A triband (144 / 440 / 1.2G)

Kenwood TS-50S HF transceiver

Yaesu G-800SA rotator

Ameritron AWM-30B cross-needle wattmeter

The two beams on my tower (south Orem) are for 20-meters and 15-meters. Above them is a 2-meter vertical and a 40-meter Lazy-H. Finally, I have a 160-meter end-fed inverted-L.

My most recent claim to fame is being inducted into the *DXCC Honor Roll*, which requires confirmed contacts with 331 countries, in my case nearly all by CW.

Today at 91 I don't do nearly as much hamming as before, but I stay involved in our Sunday stake nets. I've never done much contesting, but I try and pick up a DX contact here and there when I can.

— 73 DE W7CU

Hot Tips

Good info for the new ham, and old stuff to refresh your memory

How to disable WIRES in your Yaesu radio

FT-60R:

1. Press **F/M** then Ø, then dial to **INT MR**
2. Press **F/M**, then dial to **d1**
3. Press **F/M**, then dial to 21—**I NET**
4. Press **F/M**, then dial to **INT.MEM**
5. Press **F/M**, then **PTT**

FT-8800R / ***FT-8900R*** (on each Main side):

1. Press **SET**, then dial to 15—**DTMF W**
2. Press the dial knob, then dial to **d1**
3. Press the dial knob, then dial to 17—**INET**
4. Press the dial knob, then dial to **INT.MEM**
5. Press and hold the dial knob to exit
6. While holding the left volume knob, rotate the dial knob to **d1**

FT-7900R:

1. Press and hold **SET** to enter the menu
2. Dial to 20—**INT M**
3. Press **SET**, then dial to **d1**
4. Press **SET**, then dial to 18—**I NET**
5. Press **SET**, then dial to **INT.MEM**
6. Press **SET**, then press and hold **SET** to exit

Sorry, nothing for the ***FT-2900R*** at this time

Eddy-kit

Radio etiquette reminders

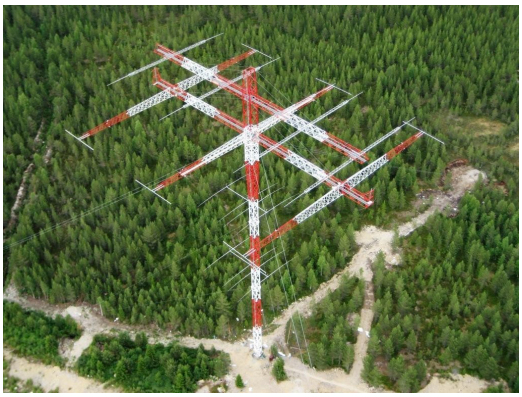
- Avoid using phonetics unless asked for it, or you're pretty sure the other party needs to hear it. Using phonetics unnecessarily is tiresome, annoying, and perceived as showing off.
- As much as you can, use plain English. Some apparently yearn so much for their CB days that their every phrase seems to contain some sort of old code, such as *10-4* or *handle*.
- Saying your call sign too often is also annoying to others; every ten minutes is plenty.

Factoids

Fun and often little-known facts

Things to brag about if you own one of these

The first "handheld" transceiver, the Galvin (now Motorola) SCR-536, was developed in 1940 and used during WW II, transmitted AM on 75 meters at 360 mW, contained five vacuum tubes, several high-power batteries, and weighed over five pounds.



The world's largest ham radio antenna is the OH8X Arcala Antenna, north of Helsinki, Finland. It's made from 1500 feet of tower sections, covered in 162 gallons of paint, stands over 100 meters tall, and weighs over 40 tons. The 11 kW rotor alone weighs two tons.

DIY

Worthwhile projects you can build on your own

40-meter Dipole Antenna Plus

Continuing our HF theme from last time, let's take things down to a slightly simpler (and cheaper) level, and build perhaps the most basic HF antenna you can make: a halfwave dipole, this time for 40 meters. The ironic part to this, however, is that the halfwave dipole is also perhaps *one of the most effective antennas you can DIY easily*. In fact, if you think about it, many good antennas are actually dipoles in one form or another. Let's start again with a parts list:

SO-239 bulkhead

√ Two 1-1/4″ PVC slip (not threaded) caps and PVC glue
√ 3″ long 1-1/4″ PVC tubing
√ Four 8″ zip ties
√ SO-239 bulkhead (flanged and solderable) connector
√ Four #6 screws (about 3/4″), nuts, and lock washers
√ Three 3/16″ or #10 eyebolts (about 2″) and nuts
√ 64 feet of stranded 14 AWG wire (THHN insulation is good)
√ Two dogbone (or other) insulators

PVC slip cap

Drill a 3/16″ hole in the center of one of the PVC caps, then install one of the eyebolts and its nut in the hole. Apply a *smear of* PVC glue to the inside of the clean, bolted cap, then insert the clean PVC tubing and allow to dry. Drill two more 3/16″ holes in the sides of the same bolted cap, on opposite sides from each other, about the middle of the cap (not the tube) sides. Install the remaining eyebolts and nuts in the newly drilled holes. Drill two 3/16″ holes in the PVC *tubing* below the side eyebolts, about 1/4″ below the cap edge.

In the center of the other PVC cap, drill a 10 mm hole. Place the SO-239 bulkhead on the hole to locate where the smaller flange holes should be drilled, then drill the four #6 (about 9/64″) holes. Cut the wire in half and thread one of the wires through one of the side eyebolts, its nearest 3/16″ tube hole into the tube, then through the large hole in the loose cap. Thread the other wire through the other side eyebolt, its nearest 3/16″ tube hole into the tube, then again through the large cap hole. (BTW, using 12 AWG instead will lower your loss.)

Strip and solder the end of one wire appearing through the large cap hole onto the center conductor of the bulkhead, then connect the other (using a crimped lug, for example) to one of the four bulkhead screws. Bolt the bulkhead onto the cap, then glue the cap to the tube. Drill a 3/16″ hole in the cap right next to the bulkhead, for a rainwater drain. Zip tie a loop in each wire around its eyebolt about an inch from the eyebolt as a strain-relief. Use the following to measure the wire from the eyebolt to its dogbone insulator (use the lowest band frequency to reduce antenna loss throughout the band):

Dogbone insulator

$$234 \div 7.00 \text{ MHz} \times 0.95 = 31.757 \text{ ft} \approx 31 \text{ ft } 9 \text{ in}$$

Thread the end of each wire through the dogbone, and zip tie the wire back around itself, but do not cut it, so that you can tune it if needed. Your 40-meter dipole is now ready to use.

DIY, continued

40-meter Dipole Antenna Plus

The completed 40-meter dipole

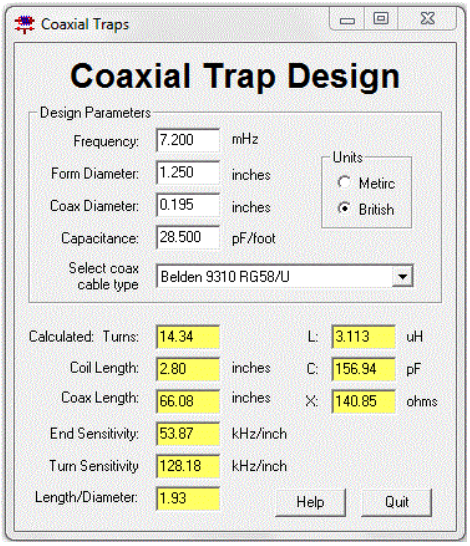
But wait...there's more! Here's where the ***Plus*** part comes in.

Wouldn't it be nice to somehow turn this simple gem into a dual-bander for, say, 80 meters *and* 40 meters, yet keep the project simple? Well, knowing a little about reactance and resonance, we can build what's known as a ***trap***, which will transform our nice 40-meter dipole into a dual-band dipole. And since the inductance and capacitance (and therefore reactance) properties of RG-58 are well-known, let's use a length of that coax as the trap conductor. You're also going to need to cut two more 24-foot lengths of the 14 AWG antenna wire for the 80-meter wires, and remove the dogbone insulators from the 40-meter dipole.

$$L = \frac{\mu_0 N^2 A}{l}$$

Air-core inductance

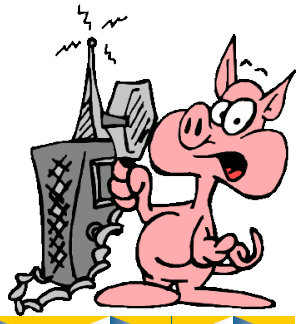
The goal is to use parts that you already have, and it turns out I have a short tube of 1-1/4˝ Schedule 40 PVC plus a roll of RG-58/U (not RG-58A/U). On one hand, you can use the "air-core inductance equation" to calculate the trap inductance to start with. On the other hand, you can use the *Coaxial Trap* program (freeware download from VE6YP) to perform that calculation and more. Entering what we know (frequency, coax type, PVC diameter), it indicates that we need 66 inches of the coax in 14-1/3 turns around the PVC. After winding and securing the coax to the PVC, cut the tube to an inch past the coax windings.



Make use of the trap's internal capacitance by connecting the center conductor of one end to the shield of the other end. Attach one wire of the 40-meter dipole to one (the unconnected trap center conductor) end, and the 80-meter wire to the other (shield) end of the trap. Attach the 40-meter wire to the trap PVC tube to relieve the strain on the trap coax. Thread the other end of the 80-meter wire through a dogbone insulator, such that the length of the wire between the trap and the dogbone is 21 ft 5 inches. You might want to borrow an antenna analyzer to make sure your 80-meter wires are length-tuned to about 3.7 MHz, and that the 40-meter section is still tuned to 7.0 MHz. Your dual-band 40/80 HF antenna is complete! See W8JI Traps for more tips on improving this antenna.

Finished trap, showing connections

Noji Ratzlaff, KNØJI (knØji@arrl.net)



Side of Bacon

A little ham humor

Antennas in every direction, no need for rotors

Please send your good humor material to ***uvarcshack@gmail.com***

Anything wrong here?

Can you spot the kitty cat walking among the discarded ham radio and other electrical parts?

For Your Insight

Information you could use

AmazonSmile

Our club now has an *AmazonSmile* account. This way, when you make Amazon purchases, Amazon will donate 0.5% of your pre-tax total to UVARC, at no extra cost to you.

Here's how it works: instead of making Amazon purchases on amazon.com, shop at smile.amazon.com instead. If this is your first time shopping through *AmazonSmile*, they'll ask you to select a charity. Please select *Utah Valley Amateur Radio Club*. After that, all smile.amazon.com purchases will credit your favorite club, and we thank you for the couple of extra clicks.

This is good timing for UVARC, since Christmas is coming up, and we hope people will remember to make all their Amazon purchases this way.

https://smile.amazon.com/ch/81-3606416

Lynx

Websites for your education and leisure

Utah Repeaters by Jeff

Utah Mesh Network Map

For the New Ham Radio Operator

Ham Radio Equipment and DIY

Ham Radio Groups and Nets

Recommended Study Method (for exams)

Ham Radio Glossary

We welcome other input for Lynx

Questions of the Month

Test your knowledge (answers next page)

G3AØ1 : What is the significance of the sunspot number with regard to HF propagation?

A. Higher sunspot numbers generally indicate a greater probability of good propagation at higher frequencies

B. Lower sunspot numbers generally indicate greater probability of sporadic E propagation

C. A zero sunspot number indicate radio propagation is not possible on any band

D. All of these choices are correct

E3CØ2 : What is indicated by a rising A or K index?

A. Increasing disruption of the geomagnetic field

B. Decreasing disruption of the geomagnetic field

C. Higher levels of solar UV radiation

D. An increase in the critical frequency

Calendar

Upcoming events of interest (times are Mountain Time)

Utah County Ham Exam Sessions

BYU J. Reuben Clark Law School building

Wed October 19, 7:00 to 8:45 pm
Sat October 22, 2:30 to 5:00 pm
Wed November 16, 7:00 to 8:45 pm
Sat November 19, 2:30 to 5:00 pm
Sat December 17, 2:30 to 5:00 pm
Wed December 21, 7:00 to 8:45 pm

Major Contests

CQ Worldwide DX Contest

1800 October 28 to 1800 October 29

Rules and N3FJP log

ARRL November Sweepstakes

1400 November 19 to 2000 November 20

Rules and N3FJP log

ARRL 10-meter Contest

0700 December 10 to 0700 December 12

Rules and N3FJP log

Club Meeting Calendar (6:30 pm)

Orem Council Chambers, 56 N State St

November 3 January 5
February 2 March 3

Orem Friendship Center, 93 N 400 E

December 1 (potluck dinner)

Regular Nets

RACES Net, Thu Oct 20 8:00 pm, 147.12
Skyline Net, Sun 8:00 pm, 147.08
Jackson Hole Net, Mon 8:00 pm, 146.76
Ladies' Net, Tue 6:00 pm, 146.78
UARC 76'ers, Wed 7:00 pm, 146.76
Youth Net, Thu 6:30 pm, 146.78
New Ham Net, Thu 7:00 pm, 146.78
CERT Ham Net, 2 & 4 Thu 8:00 pm, 146.78
Singles' Net, TBD, 146.78
Utah County 6 meters, Fri 8:00 pm, 50.140
6-Pack Net, Fri 9:00 pm, 50.150

Swap Meet

Buy or sell your wares here

- *Carl's Joystick* "Pockrus" dual-band aluminum J-pole antenna ($20, *we7omg@gmail.com*)
- Super-elastic Signal Stick dual-band flexible whip antenna ($20, *signalstuff.com*)
- Note: there are no brick-and-mortar ham radio stores in Utah, but many of us purchase parts to build amateur equipment from local places such as Ra-Elco, Ham Depot, and HF. You can also pick up some good deals on new or used equipment from QRZ, KSL, and SecondhandRadio, plus fun and gag ham stuff from HamCrazy.

Answers to the Questions of the Month

G3AØ1 : **A** (Higher sunspot numbers generally indicate a greater probability of good propagation at higher frequencies)

E3CØ2 : **A** (Increasing disruption of the geomagnetic field)

Utah Valley Amateur Radio Club

Orem, Utah, USA

K7UVA
Phone/Text: 801-368-1865
Email: uvarcinfo@gmail.com
Repeater: 146.780-, 100.0

Newsletter input?
Email uvarcshack@gmail.com
Need help?
Email uvarcelmer@gmail.com

Amateur Radio for Utah Valley

We're on the web!
uvarc.club

The *Utah Valley Amateur Radio Club* is a 501(c)(3) non-profit group that was organized in an obscure Orem fire station on 02-05-2016 to provide hams in Utah County and the surrounding area a way to gather and discuss all things ham. Our primary purposes are to help new hams in their new-found adventures, and to give more experienced hams an excuse to share their knowledge and wisdom in a friendly atmosphere of fellowship. We are in no way answerable to UARC, the 76'ers, UCARES, RACES, the SCATeam, Daughters of Utah Pioneers, the Secret Service, or any other organization, although many of our members are also members of the same.

This alleged newsletter is supposed to be published periodically by the Utah Valley Amateur Radio Club. Its purpose is to convey the tone and temperament of the club, and to inform its members. For more information about our club or about ham radio in general, please contact us by email. To join, go to www.facebook.com/groups/uvarc/ and request membership.

Our fearless leadership

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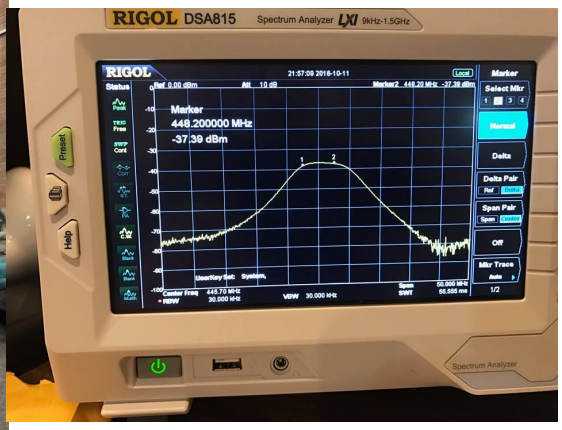
From all of us to you, 73